ORLANDO SCIENCE CENTER

Discovery Lab Post-Visit Activities

BioLab

Grades 6-8

We hope that you enjoyed your visit to the Orlando Science Center! As a means of enhancing and extending your students' Discovery Lab experience into the classroom, we are providing you with these post-visit materials to share with your class.

Discussion Topics:

- In the lab, we measured the levels of CO_2 in a terrarium (sampling bottle) of a plant. We recorded and compared the difference between the initial and final CO2 values for the plant in darkness and in light. *From a controlled lab setting, how do you think the CO2 values for photosynthesis and respiration would compare to a plant outdoors with varying environmental conditions? Do you think these values would be different? Why?*
- In the lab, we did an experiment on ghost shrimp in order to observe the physiological effects on the body from stimulants and depressants. Many chemicals are tested on animals and plants before they are available for human consumption/use. *What are the advantages and disadvantages of testing chemicals on animals and plants? How do your feelings about chemical testing on animals effect your decisions as a consumer?*

In Class Activities:

- In this classroom experiment, you will examine the chloroplasts inside a plant cell and observe the effects of salt water on the cell. Materials needed: compound optical microscope, a beaker of water containing live elodea or other small plant, distilled water, salt water, microscope slides, paper towels and cover slips. Instructions: Remove a small leaf from the *elodea* and place it on a clean, dry slide. Add a drop of distilled water and cover with a cover slip. Examine the specimen with your microscope using the scanning objective. If your microscope has a diaphragm, keep it on a low light setting. Find a good viewing area and rotate to low power. You should see a pattern of rectangular cells. Study the different organelles inside each cell. Examine the various cell layers within the leaf by focusing up and down. How many cell layers are there? Adjust the diaphragm to the highest setting. This allows the most light in. What happens? Place two drops of the salt solution on the slide, just to the side of the cover slip. Now, place a small piece of paper towel next to the cover slip on the opposite side. If this is done correctly, the paper towel will absorb the fresh water and draw the salt water through the plant cells. Examine the cells under the microscope. What happened? (A minute or so after adjusting the diaphragm to allow more light in, green globs become visible rotating around the outer edge of the cell. These are the chloroplasts. When exposed to light, they become excited and move rapidly. Chloroplast shape and size differs from species to species, and even for plants of the same species grown under different conditions. Adding salt water (a hypertonic solution) to the *elodea* causes the cell to lose water and pressure in the cell decreases leaving gaps between the cell wall and cell membrane and causing the chloroplasts within the cells to retract towards the center of the cell.)

Math Problems:

- What is the probability that Bob who is heterozygous for curly hair (Hh) and Lilly who has straight hair (hh) will have children with curly hair?
- A mint plant in a terrarium exposed to light had initial CO2 levels measured at 354 ppm at 2 minutes and 220 ppm at 15 minutes. What is the difference in CO2 levels from the initial reading to the final reading?

Writing Prompt:

Genetic testing can be done on blood and tissues to find genetic disorders. Doctors offer genetic testing to their patients for many reasons; such as testing for various genetic diseases or to find out if they carry a gene for a disease and might possibly pass it on to their children. Have students read about genetic testing at the library and on the computer. Tell them to explore the advantages and disadvantages of genetic testing. What are the implications for family planning and life insurance?

Art Project:

Create a poster explaining the steps of your family tree showing the inheritance of at least one trait. Include two generations and the genotypes and phenotypes of the chosen trait(s) for each generation.

Additional Resources:

Biology: Life as We Know It! by Dan Green
Science Explorer Human Biology and Health by Inc. Prentice Hall
Encyclopedia of Nature by DK Publishing